Joint Advanced Range Safety System

The joint advanced range safety system is a collaborative effort between Dryden Flight Research Center and the Air Force Flight Test Center at Edwards Air Force Base to develop a state-of-the-art mission planning, risk analysis, and risk management tool for range safety. The Range Safety organizations from all Major Range and Test Facility Bases are being asked to support the development, testing, and operation of unmanned aerial vehicles and reusable launch vehicles. It is the vision that the joint advanced range safety system will provide range safety support for these missions.

Primary System Elements

The joint advanced range safety system consists of two primary elements: a mission analysis software tool and the real-time operations tool. The mission analysis software tool quantifies the range safety risk for a given flight path and its associated vehicle parameters using a computerized method. This method will streamline the range safety analysis process by providing a consistent, high fidelity solution in less time than required by present methods of analysis.

Additionally, the real-time operations tool will provide the Range Safety Officer with near real-time assessment of the range safety risks during flight. This capability has many possible applications for the unmanned aerial vehicle or reusable launch vehicle operator, including the following:

- Assessment of unmanned aerial vehicle overflight of populated areas
- Allowing extended flight of an anomalous vehicle
- Recovery of an off-nominal vehicle at an alternate landing site
- Selection of an alternate flight or entry path

Status

The joint advanced range safety system mission analysis software tool is nearing operational status. Training of Dryden Flight Research Center, Air Force Flight Test Center, and 30th Space Wing Range Safety analysts has occurred. Dryden analysts are in the process of comparing test case results run on the mission analysis tool versus the results run by other methods. Other accomplishments include the creation of an interface control document for users who would like to develop their own modules and a new graphics tool to display results.

The joint advanced range safety system mission analysis software tool will not be undergoing an independent software assurance assessment due to lack of funding. The 30th Space Wing is currently leading the effort to begin work on the joint advanced range safety system real-time operations tool and the development of tools for re-entry risk analysis.

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The 45th Space Wing is leading an effort to develop tools specific for the launch mission at the Eastern Range. Johnson Space Center is currently working to integrate the Public Entry Risk Assessment tool onto the joint advanced range safety system toolbench. The Center developed the Public Entry Risk Assessment tool in-house to analyze the risk posed by Space Shuttle re-entry trajectories.